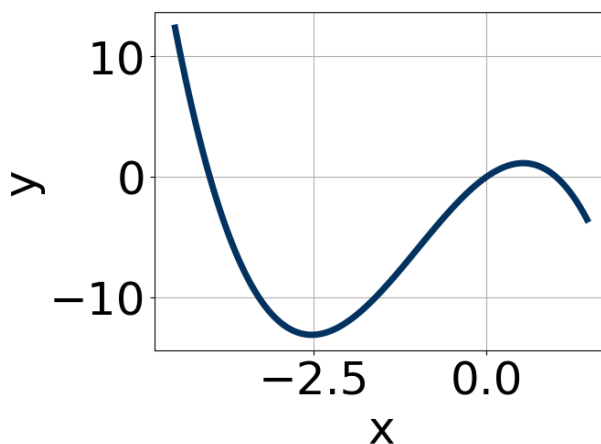1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.
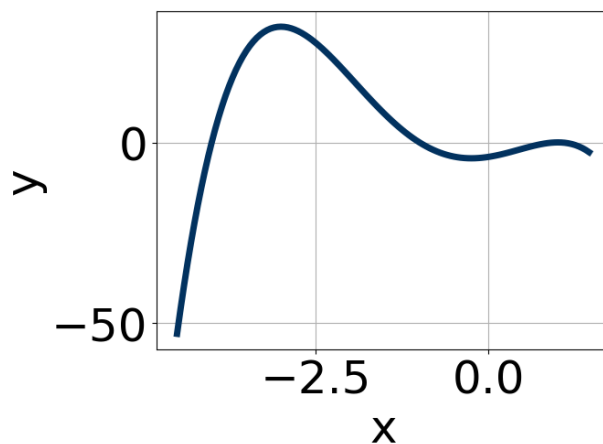
$$-5 + 5i \text{ and } 3$$

A. $b \in [-11, -3], c \in [16, 22],$ and $d \in [145, 151]$

B. $b \in [1, 6], c \in [-1, 7],$ and $d \in [-18, -13]$

C. $b \in [2, 12], c \in [16, 22],$ and $d \in [-156, -141]$

D. $b \in [1, 6], c \in [-9, 1],$ and $d \in [13, 20]$

E. None of the above.

---

2. Which of the following equations *could* be of the graph presented below?

A. $-9x^5(x - 1)^9(x + 4)^9$

B. $17x^{11}(x - 1)^9(x + 4)^9$

C. $6x^5(x - 1)^8(x + 4)^9$
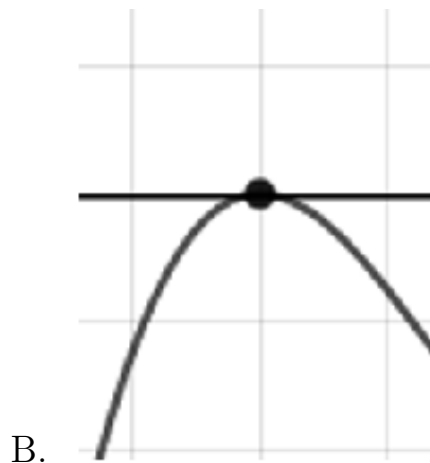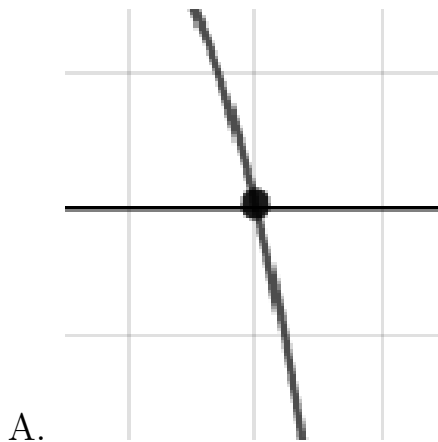
D. $-7x^7(x - 1)^8(x + 4)^4$

E. $-17x^7(x - 1)^{10}(x + 4)^9$

---

3. Which of the following equations *could* be of the graph presented below?

A. $-17(x-1)^4(x+4)^8(x+1)^9$

B. $20(x-1)^{10}(x+4)^7(x+1)^4$

C. $2(x-1)^{10}(x+4)^9(x+1)^9$

D. $-6(x-1)^7(x+4)^8(x+1)^{11}$

E. $-4(x-1)^{10}(x+4)^7(x+1)^9$
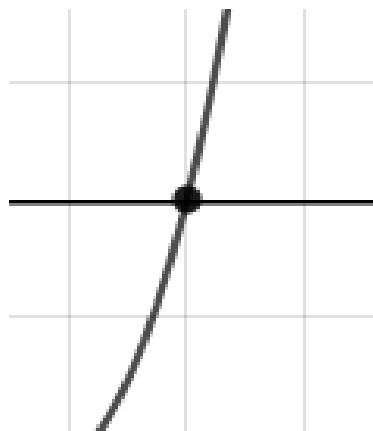
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4. Describe the zero behavior of the zero $x = -6$ of the polynomial below.

$$f(x) = -4(x-8)^6(x+8)^2(x+6)^9(x-6)^6$$

A.

B.

C.   D.

E. None of the above.

---

5. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-4 - 2i \text{ and } -2$$

A. $b \in [8, 13], c \in [34.2, 37],$ and $d \in [40, 42]$

B. $b \in [-4, 6], c \in [4.5, 8.2],$ and $d \in [6, 9]$

C. $b \in [-4, 6], c \in [3, 4.3],$ and $d \in [2, 5]$

D. $b \in [-14, -8], c \in [34.2, 37],$ and $d \in [-40, -32]$

E. None of the above.

---

6. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.
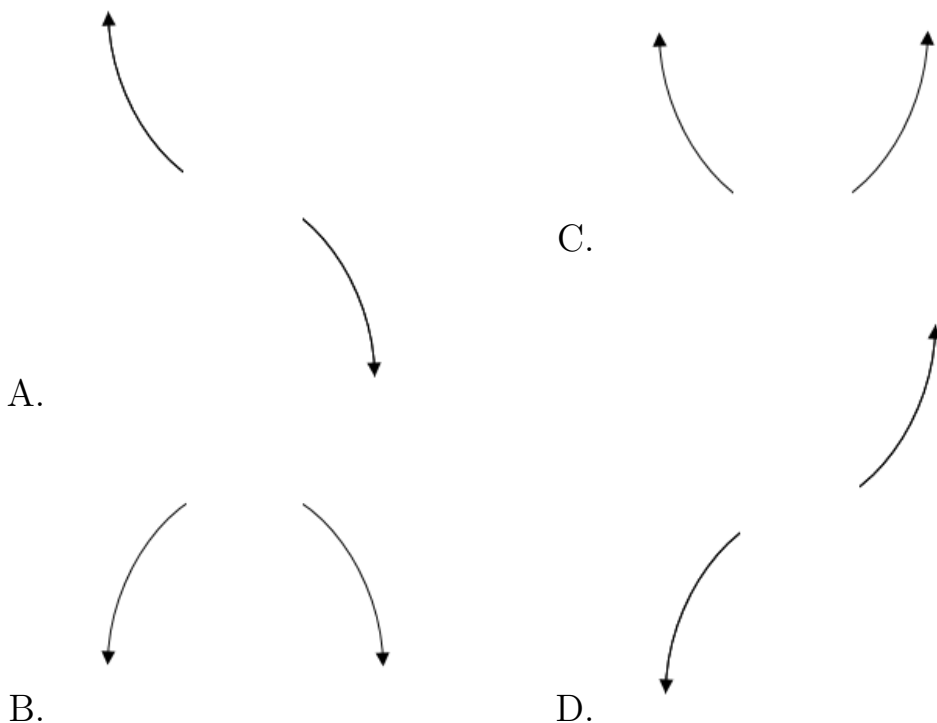
$$\frac{-7}{5}, \frac{5}{2}, \text{ and } \frac{-1}{4}$$

A. $a \in [35, 41], b \in [48, 58], c \in [-131, -125],$ and $d \in [-42, -32]$

B. $a \in [35, 41], b \in [-36, -27], c \in [-158, -150],$ and $d \in [33, 37]$

C. $a \in [35, 41], b \in [-148, -145], c \in [95, 106],$ and $d \in [33, 37]$

D. $a \in [35, 41], b \in [-36, -27], c \in [-158, -150],$ and $d \in [-42, -32]$

E. $a \in [35, 41], b \in [32, 40], c \in [-158, -150],$ and $d \in [33, 37]$

---

7. Describe the end behavior of the polynomial below.

$$f(x) = 8(x - 4)^4(x + 4)^9(x + 8)^4(x - 8)^5$$

C.

A.

B.   D.

E. None of the above.

---

8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{1}{2}, \frac{7}{4}, \text{ and } 4$$

A. $a \in [7, 12], b \in [-23, -12], c \in [-71, -59],$ and $d \in [-32, -21]$

B. $a \in [7, 12], b \in [-51, -44], c \in [77, 82],$ and $d \in [-32, -21]$

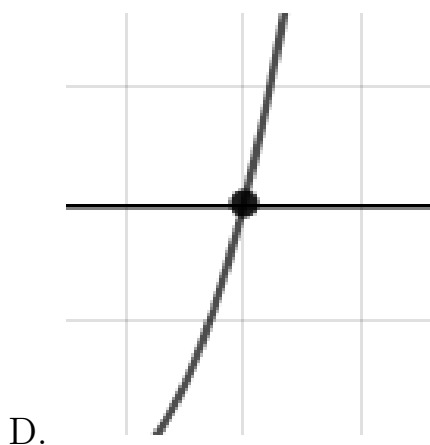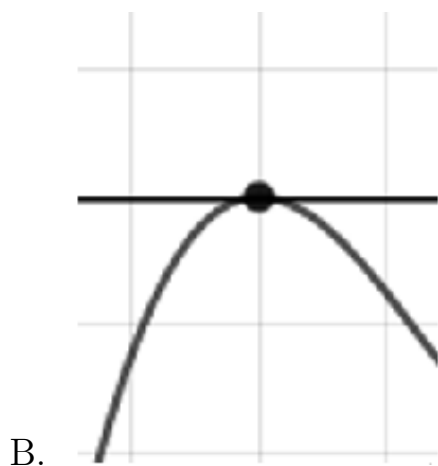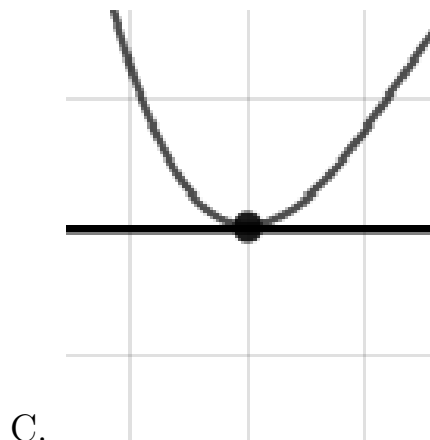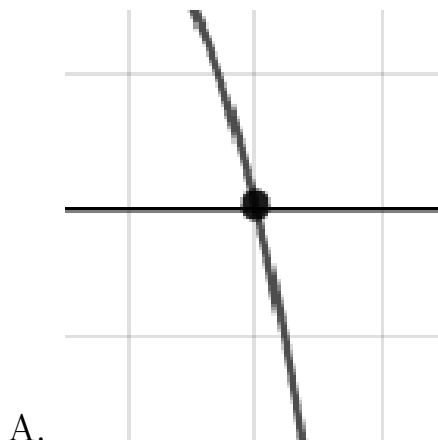C. $a \in [7, 12], b \in [49, 55], c \in [77, 82],$ and $d \in [28, 30]$

D. $a \in [7,12], b \in [-51,-44], c \in [77,82],$ and $d \in [28,30]$

E. $a \in [7,12], b \in [-44,-34], c \in [31,43],$ and $d \in [28,30]$

---

9. Describe the zero behavior of the zero $x = 2$ of the polynomial below.
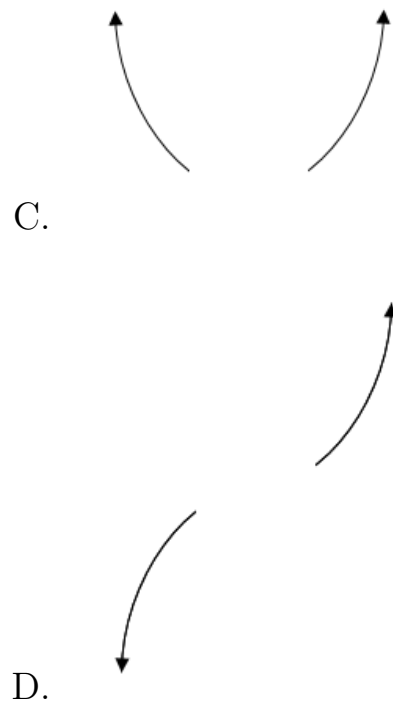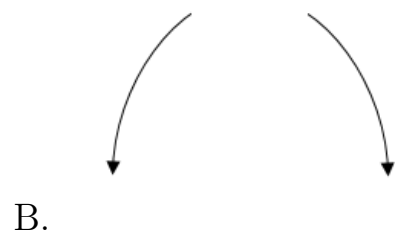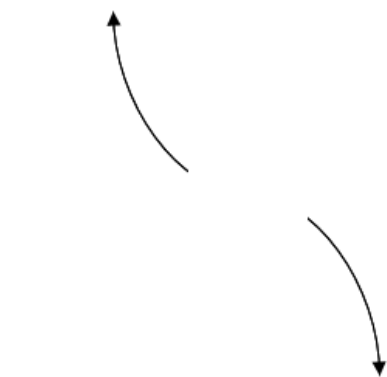
$$f(x) = -4(x-2)^5(x+2)^{10}(x-3)^6(x+3)^{10}$$

A.

C.

B.

D.

E. None of the above.

---

10. Describe the end behavior of the polynomial below.

$$f(x) = 2(x+5)^3(x-5)^6(x+3)^3(x-3)^5$$

A.

C.

B.   D.

E. None of the above.